Article

Life course influences on later life health in China: Childhood health exposure and socioeconomic mediators during adulthood

Hal Kendig[a,b], Cathy Honge Gong[a,b,*], Vasoontara Yiengprugsawan[a,b], Merril Silverstein[c], James Nazroo[d]

[a] Centre for Research on Ageing, Health and Wellbeing, Research School of Population Health, Australian National University, Australia
[b] ARC Centre of Excellence in Population Ageing Research, Australia
[c] Aging Studies Institute, Syracuse University, USA
[d] The ESRC Centre on Dynamics of Ethnicity (CoDE), the University of Manchester, UK

A B S T R A C T

China's unprecedented population aging and social and economic change raise important issues concerning life course determinants of advantage or disadvantage into later life. Data from the China Health and Retirement Longitudinal Study (CHARLS) 2013 were analysed to identify the influence of childhood health on later life health as indicated by self-rated health and how this influence could be mediated by social and economic positions (SEP) and resources later in the life span. CHARLS provides nationally representative data on 18, 000 individuals aged 45 years and above in approximately 150 districts and 450 villages. Both multivariate logit regression model and KHB method (Karlson/Holm/Breen method) were applied to examine and decompose the life span influences on later life health. The results show that the childhood health, accounts for approximately half of the effect directly and another half of the effect indirectly through social and economic variations during adulthood. Relative living standard, marital status and urban residence are the most significant and important social and economic mediators for men; For women, living standard and secondary schooling are most influential while marital status is not significant. Implications for social and economic policies to improve later life health are discussed.

1. Introduction

Population aging in China is unprecedented in terms of its magnitude and rapidity and also in terms of massive social and economic changes. The productivity and wellbeing of the world will be critically influenced by the health capacities of the increasing numbers of aging people (World Bank, 2014; WHO 2015). In China since the 1950s important improvements in the social determinants of health have been underpinned by government-led action towards social egalitarianism and equal opportunity during the early Mao years, socio-economic development during reforms, and the benefits of societal impacts of the one child policy since 1979. There is increasing social and policy recognition that population aging will be a fundamental factor not only in the wellbeing of aging individuals but also in the productivity of the economy and demands on health and aged care services. These are critical issues in China accentuated by its large population and the one child policy (United Nations, 2013; Zhao, Smith & Strauss, 2014).

Concepts in life span epidemiology provide an important framework for investigating ways in which individual and social change influence the health of aging people (Ben-Shlomo, Cooper & Kuh, 2016). On the one hand aging individuals progress in variable ways through their life course with continuing effects on health related to socio-economic exposures in their family, health, and work experiences from childhood through adulthood. On the other hand, these experiences are structured by opportunities and constraints in socio-economic environments that impact on people's health and evolve during successive periods of history. The interplay between individual and societal factors has consequences for health outcomes at all ages, impacting later life health directly (e.g. stress and pollution) and indirectly through financial and social resources as well as the availability of health services (Kendig & Nazroo 2016). Understanding cumulative processes of advantage and disadvantage over the life course and between generations (Dannefer, 2003; Dannefer & Kelley-Moore 2009) is important for elucidating long-term and persistent inequalities in health outcomes over time.

1.1. Social and economic change in contemporary China

The current cohort of aging Chinese have had lives shaped by the tremendous social change in China before and after WWII. These include intense deprivation during the pre-war Japanese occupation, the Civil War, continuing famine and turmoil during the early Mao years, and subsequent urbanisation, industrialisation, and (eventually) rising living standard (Gong, Leigh & Meng, 2012). Life expectancy at birth rose dramatically from 43 years in 1960 (the earliest available) to 76 years in 2014 according to World Bank World Development Indicators.[1]

The Mao era's ideology of "equal access for equal need" in health care (Gibson, 1972) and education applied political and community pressures to direct scarce health resources to the prevention of infectious diseases in rural areas and delivery of primary care for workers and rural residents (Gibson, 1972; Gong et al., 2012). Major economic reforms initiated in the late 1970s and early 1980s drove further changes in China, including massive and uneven urbanisation, industrialisation, the one-child policy, and educational investment, all with consequences for rising living standards and income inequality (Gong et al., 2012; Xie & Zhou, 2014). The economic reforms in China began from the private sector in the eastern regions and then progressed to the public sector and other regions, leading to increasing inequalities across Chinese society (Yeatts et al., 2013) and increasingly uneven development between urban and rural areas (Xu, Shi & Huang, 2014). After the introduction of the new rural cooperative insurance in 2003, coverage of medical insurance increased dramatically to 96% of all Chinese, although significant inequalities persist in outpatient services and hospitalization (Gong, Kendig & He, 2016), out-of-pocket payment (Wang & Zheng, 2014), and premium contributions (Li & Zhang, 2013) by health insurance type.

1.2. Social determinants of health

The World Health Organization's (WHO) efforts on social determinants of health and wellbeing in developing countries have concentrated on the earlier stages of the life span as a key priority for social investment. The WHO (2008) report 'Closing the gap in a generation report' calls for achieving '… healthy equity through action on the social determinants of health' and creating '… conditions for a flourishing older life'. This aligns with the life course approach to later life health research (Dannefer, 2003; Ben-Shlomo et al., 2016). The limited evidence on social and economic determinants of health throughout the lifespan has generally focused on Western or high income settings (Hertzman, Power, Matthews & Manor, 2001; Kendig & Nazroo, 2016).

In the social determinants literature, social and economic position (SEP) has been measured by parent's education and occupation in childhood, educational attainment and income or expenditure in adulthood, and use of health care resources (Yip et al., 2007; Lei et al., 2014; Shen & Zeng, 2014). Education, household expenditure, lifestyle behaviours and psychosocial factors has been found to be important to maintain good health and prevent chronic diseases in later life (Hu, Liu & Willett, 2011; Lei et al., 2014; Cai, Coyte & Zhao, 2017). Additional factors reported to be related to later life health in China include whether both parents were alive at age 10, social engagement, religious involvement, receiving adequate medical service, marital status, and urban or rural area of residence (Zeng, Gu & Land, 2007; Wen & Gu, 2011; Lei et al., 2014; Shen & Zeng, 2014).

Previous life course studies in China have reported: childhood disadvantageous exposure is associated with poor health and socioeconomic status (SES) in middle to later life (Zeng et al., 2007; Smith, Shen, Strauss, Zhe & Zhao, 2012); childhood SES improves adult SES and thus indirectly promotes longevity and health in advanced age (Shen & Zeng, 2014); both childhood and adult socioeconomic conditions affect mortality, cognitive impairment and self-rated health directly and indirectly among older adults (Wen & Gu, 2011).

These studies have notable limitations. For instance, some were based on local or regional data in China (Zeng et al., 2007; Wen & Gu, 2011; Smith et al., 2012), or covered only specific age groups, such as the oldest-old cohort aged 80 and plus, Zeng et al. (2007) and Shen and Zeng (2014), or those aged 65–79 by Wen and Gu (2011). To date, Smith et al. (2012) is one of the few studies that have investigated the association between childhood health and later life health in China but the ways in which further midlife experiences impact on these associations require further examination in a more complete life span analysis. Wen and Gu (2011) used the difference method (Valeri & VanderWeele, 2013) to examine how the adulthood social and economic advantages could change the influences of early life disadvantages on late life health and socio-economic outcomes.[2] However, this difference method has notable limitations by not considering the existence of exposure-mediator interactions and nonlinearities in the model (Breen, Karlson & Holm, 2013). The aim of our present study is to examine the influence of childhood health on later life health and how this influence could be decomposed into direct and indirect effects, through the mediation of social and economic positions and resources in the later life span. We first follow the difference method used by Wen and Gu (2011), to build successive multivariate logistic regression models to test and elucidate possible cumulative life-stage effects on later life health. We then use the more rigorous KHB method (Karlson/Holm/Breen method, see Kohler, Karlson and Holm (2011), Breen et al. (2013)) to provide unbiased decompositions of the direct and indirect influences[3] for the whole sample, as well as by gender after considering exposure-mediator interactions. The findings potentially can inform multi-sector policies that target priority groups and actions over the life span to more equitably improve the health of ageing men and women to better prepare China and other developing and middle income countries in their aging population.

2. Data, measurement and method

This paper draws on the nationally representative China Health and Retirement Longitudinal Study (CHARLS) of Chinese aged 45 years and over who were born from the early 1920s to the late 1960s. The primary dependent variable is self-rated general health which has been used widely for comparative studies of aging, health, and wellbeing in Asian and western countries (e.g. French et al., 2012), as well as in China (Lei et al., 2014).

Although the CHARLS data do not permit a full investigation of individual life history influences on aging, they do provide retrospective individual data on health and socio-economic at selected points earlier in respondents' lives (Zhao et al., 2014). As our study focuses on individual life span social determinants, we do not examine socioeconomic influences at the community level such as pollution, per capita gross domestic product (GDP), and the neighbourhood environment.

2.1. Data source

The CHARLS study 2013 was conducted by the China Centre for Economic Research of Peking University (Zhao et al., 2014). Face-to-face interviews in respondents' homes collected detailed information on demographic characteristics, social and economic conditions, and health and health-related behaviours. In the first wave of CHARLS in 2011, participants were randomly sampled using a multi-stage probability-proportional-to-size technique, stratified by regions and then by

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[2] This method is called as the difference method because it compares the differences of the estimated coefficients between nested models.

[3] KHB method provides unbiased decomposition of the direct and indirect influences for the non-linear models when compared to the difference method.